

# PATENT ABSTRACTS OF JAPAN

(11)Publication number : 06-125038

(43)Date of publication of application : 06.05.1994

(51)Int.Cl.

H01L 27/02  
H03B 5/32  
H03F 3/195  
H04R 17/00

(21)Application number : 04-274003

(71)Applicant : MATSUSHITA ELECTRIC IND CO  
LTD

(22)Date of filing : 13.10.1992

(72)Inventor : EDA KAZUO  
TAGUCHI YUTAKA  
KANAHOSHI AKIHIRO  
OGURA TETSUYOSHI

## (54) ELECTROACOUSTIC INTEGRATED CIRCUIT AND ITS MANUFACTURE

### (57)Abstract:

**PURPOSE:** To obtain a small, lightweight electroacoustic integrated circuit of high performance by directly sticking an electroacoustic element having excellent electroacoustic characteristics to a III-V compound semiconductor substrate provided with electronic elements.

**CONSTITUTION:** A surface acoustic wave resonator 2 composed of a single-crystal piezoelectric quartz substrate is directly stuck to a GaAs substrate 1 made of a III-V compound semiconductor. Then a transistor 3, variable capacitance diode chip 4, passive chip parts 5 such as capacitor, inductor and resistor, and the electrode 6 of the resonator 2 are formed on the substrate 1. The oscillation frequency of the resonator 2 can be changed when the capacitance of the chip 4 is changed by changing the voltage applied across the chip 4. The quartz substrate 2 is directly stuck to the substrate 1. Therefore, a very small voltage- controlled oscillator can be obtained when the integrally united substrates 1 and 2 are housed in a sealed container.

